What is Claimed is:

1. A composition comprising at least two carbon nanotubes, each nanotube with an emission spectrum that is distinguishable from other nanotubes in the composition.
2. The composition of claim 1, further comprising at least 10, at least 25, at least 50, at least 100, at least 250, at least 500, at least 750, or at least 1000 nanotubes.
3. The composition of claim 1, wherein the nanotubes are single wall carbon nanotubes.
4. The composition of claim 2, wherein each nanotube is of a different length.
5. A library comprising two or more probes, each probe distinguishably labeled with at least one carbon nanotube.
6. The library of claim 5, wherein the probes are oligonucleotides, chemically modified oligonucleotides, oligonucleotide analogs or peptide nucleic acids
7. The library of claim 5, wherein the probes comprise all possible nucleotide sequences for a probe of defined length.
8. The library of claim 7, wherein the probe length is selected from the group consisting of 4, 5, 6, 7 and 8 nucleotides.
9. The library of claim 5, wherein at least one probe is labeled with at least two nanotubes.
10. The library of claim 5, wherein the probes comprise random nucleotide sequences.
11. The library of claim 5, wherein the probes comprise at least one constant nucleotide.
12. The library of claim 5, wherein the probe length is selected from the group consisting of 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14 and 15 nucleotides.
13. The library of claim 5, wherein the probe length is greater than 15 nucleotides.
14. A method of identifying probes or analytes comprising:
    a) labeling each probe or analyte with at least one carbon nanotube;
    b) exciting the nanotubes; and
    c) detecting the emission spectra of the excited nanotubes.
15. The method of claim 14, wherein the nanotubes are excited with an ultraviolet (UV) laser or an electron beam.
16. The method of claim 15, further comprising identifying one or more peaks in the optical emission spectrum of each nanotube.
17. The method of claim 16, further comprising determining the wavelength of each peak.

18. The method of claim 14, wherein at least one probe or analyte is attached to at least two nanotubes.

19. The method of claim 14, wherein the probe or analyte is bound to a ligand.

20. The method of claim 19, wherein the ligand is selected from the group consisting of a protein, peptide, polypeptide, carbohydrate, polysaccharide, glycoprotein, nucleic acid, oligonucleotide, polynucleotide, lipid, glycolipid, hormone, receptor, antigen, allergen, antibody, substrate, metabolite, cofactor, inhibitor, drug, pharmaceutical, nutrient, toxin, poison, explosive, pesticide, chemical warfare agent, biohazardous agent, prion, vitamin, heterocyclic aromatic compound, carcinogen, mutagen, narcotic, amphetamine, barbiturate, hallucinogen, waste product, contaminant, virus, bacterium, spore, mold, yeast, algae, amoebae, *Ghiardia*, unicellular organism, pathogen, cell and infectious agent

21. A method of nucleic acid sequencing comprising:
    a) obtaining a library of probes, each probe labeled with at least one carbon nanotube;
    b) hybridizing the probes with a nucleic acid; and
    c) detecting the sequence of labeled probes hybridized to the nucleic acid.

22. The method of claim 21, further comprising moving the hybridized nucleic acid past a detector, wherein the hybridized probes move past the detector in a linear sequence.

23. The method of claim 22, further comprising exciting the carbon nanotubes with an electron beam.

24. The method of claim 23, wherein a distinguishable emission spectrum is detected from the nanotubes attached to each probe.

25. The method of claim 22, wherein the hybridized nucleic acid moves past the detector in a microchannel or microcapillary.

26. The method of claim 21, further comprising separating unhybridized probes from probes hybridized to the nucleic acid.

27. A method of producing carbon nanotubes comprising:
    a) obtaining a chip containing a layer of SiC;
    b) dividing the SiC layer into SiC deposits of predetermined size and shape;
    c) removing the Si atoms from the SiC deposits; and
    d) forming carbon nanotubes, wherein the nanotubes are of predetermined length and diameter.

28. The method of claim 27, wherein the SiC layer is divided into SiC deposits by photolithography and etching or by laser ablation.

29. The method of claim 27, wherein the SiC layer overlays a layer of silicon.

30. The method of claim 27, wherein the Si atoms are removed from the SiC deposits by heating the chip to about 1400°C in at a pressure of about 10^{-7} Torr.

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